

CLAIMS

1. A process for purifying polluted air, which process includes passing polluted air through a fluidized bed of micro-organism-containing particulate media so that, as the polluted air passes through the fluidized bed, organic pollutants therein are decomposed by the micro-organisms, with purified air containing a lower level of the organic pollutants than the polluted air that enters the fluidized bed, emerging from the fluidized bed.
5. 2. A process according to Claim 1, wherein the micro-organism-containing particulate media comprises inert particles coated with an active medium or biomass.
10. 3. A process according to Claim 2, wherein the particles have sizes that range from sub-micron to 5mm.
15. 4. A process according to any one of Claims 1 to 3 inclusive, wherein the air that passes through the bed of particulate media acts also as fluidizing medium for the particulate media, and wherein the air flow rate is from 0.7m/s to 1.5m/s.
20. 5. A process according to any one of Claims 1 to 4 inclusive, which includes maintaining the fluidized bed at or near anaerobic conditions.
25. 6. A process according to any one of Claims 1 to 5 inclusive, which includes simultaneously agitating the fluidized bed to ensure a homogeneous distribution of the microorganism throughout the bed.
7. 7. A process according to any one of Claims 1 to 6 inclusive, which includes conditioning the polluted air before passing it through the fluidized bed.
30. 8. A process according to Claim 7, wherein the conditioning comprises moistening the polluted air.
9. Air purification apparatus, which includes

a vessel providing an air purification chamber, with the vessel being adapted such that polluted air can enter the air purification chamber at a low level while purified air can exit the air purification chamber at a higher level; and

5 a plurality of micro-organism-containing particulate media in the air purification chamber, the particulate media being capable of being fluidized by air which passes through the air purification chamber.

10. Apparatus according to Claim 9, wherein the vessel comprises an operatively upright cylindrical wall component; an apertured or perforated floor spanning the inside of the wall component, with the openings in the floor constituting air inlet openings; and an apertured or perforated roof also spanning the inside of the wall component and spaced from the floor, with the openings in the roof constituting air outlet openings, and with the air purification chamber thus defined between the wall, the floor and the roof.

15. 11. Apparatus according to Claim 10, which includes agitation means in the air purification chamber, for agitating a fluidized bed of the particulate media which forms in the air purification chamber, in use.

12. Apparatus according to Claim 10 or Claim 11, which includes an air 20 conditioning chamber below the air purification chamber, when the vessel is located uprightly, with the air conditioning chamber having an apertured roof and a floor spaced from its roof, such that air can pass through the openings in the conditioning chamber roof into the purification chamber.

25. 13. Apparatus according to Claim 12, wherein air/liquid contact means is provided in the conditioning chamber, together with water distribution means for introducing water into or onto the air/liquid contact means.

14. Apparatus according to Claim 12 or Claim 13, wherein an air inlet chamber is 30 provided below the conditioning chamber, with the floor of the conditioning chamber being perforated and constituting a roof of the air inlet chamber.

15. Apparatus according to Claim 14, wherein an imperforate base, spaced from the air inlet chamber roof; a cylindrical vessel wall component extending between the base and the air inlet chamber roof; and an air inlet in the vessel wall component, are provided.

5 16. Apparatus according to any one of Claims 10 to 15 inclusive, wherein a purified air chamber is provided above the air purification chamber, with the roof of the air purification chamber constituting a floor of the purified air chamber.

10 17. Apparatus according to Claim 16, which includes an imperforate roof, spaced from the purified air chamber floor; a cylindrical vessel wall component located between the purified air chamber floor and its roof, and a purified air outlet in the purified air chamber roof.